In the Claims

Current Status of Claims

1.(**currently amended**) A method for frame multi-resolution analysis implemented on a computer comprising the steps of:

constructing isotropic, non-separable ideal windows in a dimension greater than 1 in the form of software code executable on a computer;

translating and dilating the ideal windows using translation and dilation operators in the form of software code executable on the computer;

constructing isotropic, non-separable filters in the form of software code executable on the computer from the ideal windows of the previous step, where the filters are selected from the group consisting of isotropic, non-separable low pass filters, isotropic, non-separable high pass filters and isotropic, non-separable filters that cover a desired frequency range or plurality of desired frequency ranges;

constructing isotropic, non-separable frame scaling functions in the form of software code executable on the computer; and

producing associated isotropic, non-separable wavelets in the form of software code executable on the computer from the isotropic, non-separable filters and the isotropic, non-separable scaling functions, where the wavelets and filters ~~are adapted to~~ filter and resolve or decompose multidimensional signals, data, information, or images into a plurality of non-overlapping sub-bands derived from the signals, data, information or images and corresponding to resolution levels improving analysis efficiency and improving analysis of more complex multidimensional signals, data, information or images.

2.(**currently amended**) The method of claim 1, further comprising the step of:

dividing each filter into at least one relative low pass component and at least one relative high pass component in the form of software code executable on the computer.

3.(**previously presented**) The method of claim 1, wherein the multidimensional signal is: a streaming video signal, a seismic imaging signal, a digital medical imaging signal, a satellite imaging signal, a surveillance imaging signal, a target acquisition imaging signal, a radar imaging signal, or

a sonar imaging signal;.

4.(**currently amended**) A method for analyzing data implemented on a computer comprising the steps of:

constructing at least one isotropic, non-separable wavelet in the form of software code executable on a computer including:

isotropic, non-separable filters having at least one ideal isotropic, non-separable window translated and dilated as necessary using translation and dilation operators, where the filters are selected from the group consisting of isotropic, non-separable low pass filters, isotropic, non-separable high pass filters and isotropic, non-separable filters that cover a desired frequency range or plurality of desired frequency ranges;

isotropic frame scaling functions, where translations of the frame scaling functions form a frame; and

resolving or decomposing multidimensional signals, data, information, or images into a plurality of non-overlapping sub-bands in the form of software code executable on the computer corresponding to resolution levels, where ~~with~~ the at least one isotropic, non-separable wavelet ~~improving~~ improves analysis efficiency and ~~improving~~ improves analysis of more complex multidimensional signals, data, information or images.

5.(**currently amended**) The method of claim 4, further comprising the step of:

dividing each isotropic, non-separable filter into at least one relative low pass isotropic, non-separable component and at least one relative high pass isotropic, non-separable component in the form of software code executable on the computer.

6.(**previously presented**) The method of claim 4, wherein the multidimensional signal is: a streaming video signal, a seismic imaging signal, a digital medical imaging signal, a satellite imaging signal, a surveillance imaging signal, a target acquisition imaging signal, a radar imaging signal, a sonar imaging signal, or a pattern recognition imaging signal.

7.(**currently amended**) A system for processing signals implemented on a computer

comprising:

a computer including a processing unit having encoded thereon a completely isotropic, non-separable ideal filter for frame multi-resolution analysis software including:

software encoding isotropic, non-separable wavelets adapted to resolve a multidimensional signal into ~~various~~ a plurality of non-overlapping sub-bands or resolution levels, where the wavelets are derived from:

isotropic, non-separable ideal windows or filters in a dimension greater than 1,

isotropic, non-separable low pass filters, isotropic, non-separable high pass filters and isotropic, non-separable filters that cover a desired frequency range or plurality of frequency ranges; and

isotropic, non-separable frame scaling functions where translations of the frame scaling functions form a frame;

where at least one of the wavelets ~~the system~~ resolves or decomposes multidimensional signals, data, information, or images into ~~a~~ the plurality of non-overlapping sub-bands ~~sets~~ or resolution levels ~~with the at least one isotropic, non-separable wavelet improving~~ and where the improves analysis efficiency and ~~improving~~ analysis of more complex multidimensional signals, data, information or images.

8.(**currently amended**) The system of claim 7, wherein each isotropic, non-separable high pass filter and each isotropic, non-separable low pass filter comprise:

at least one isotropic, non-separable relative low pass component and at least one isotropic, non-separable relative high pass component.

9.(**currently amended**) The system of claim 8, wherein each isotropic, non-separable relative high pass component and each isotropic, non-separable relative low pass ~~filter~~ component comprise:

at least one isotropic, non-separable relative low pass subcomponent and at least one isotropic, non-separable relative high pass subcomponent.

10.(**previously presented**) The system of claim 7, wherein each isotropic, non-separable high pass

filter and each isotropic, non-separable low pass filter comprise:

a plurality of isotropic, non-separable high pass and isotropic, non-separable low pass components, each component including at least one isotropic, non-separable relative low pass subcomponent and at least one isotropic, non-separable relative high pass subcomponent.

11.(**currently amended**) ~~A~~ The method of claim 1, wherein the completely isotropic, intrinsically non-separable low pass filter or high pass filters are derived from ~~implemented on a computer comprising:~~

~~———~~isotropic, non-separable ideal windows in a dimension greater than or equal to 1, and

~~———~~translation and dilation operators adapted to form out of the ideal windows completely isotropic, non-separable low pass filters, isotropic, non-separable high pass filters and isotropic, non-separable filters that cover a desired frequency range or plurality of frequency ranges from the isotropic ideal filters.

12.(**currently amended**) The filter of claim 11, wherein the isotropic, non-separable low pass filter comprises a mathematical construct given by:

$$m_0(\xi) = \sqrt{2}\,\chi_{D/\sqrt{2}}(\xi),\ \xi \in \mathbf{T}^2$$

in the form of software code executable on the computer.

13.(**previously presented**) ~~A~~ The method of claim 1, wherein the completely isotropic, intrinsically non-separable scaling function ~~implemented on a computer comprising~~ comprises a mathematical construct given by:

$$\phi = F^{-1}(\chi_D)$$

in the form of software code executable on the computer.

14.(**currently amended**) ~~An~~ The method of claim 1, wherein the isotropic, non-separable wavelet scaling function ~~implemented on a computer comprising~~ comprises a mathematical construct given by:

$$\phi(R) = \frac{J_{n/2}(\pi R)}{(2R)^{n/2}},\quad R > 0$$

in the form of software code executable on the computer.

15.(**currently amended**) The method of claim 1, wherein the isotropic, non-separable wavelets are derived from ~~implemented on a computer comprising:~~

———at least one isotropic, non-separable filter including at least one isotropic, non-separable ideal window and translation and dilation operators, where the filters are selected from the group consisting of isotropic, non-separable low pass filters, isotropic, non-separable high pass filters and isotropic, non-separable filters that cover a desired frequency range or plurality of frequency ranges; and

———isotropic frame scaling functions, where translations of the frame scaling functions form a frame.

16.(**currently amended**) The ~~wavelet~~ method of claim ~~15~~1, wherein the wavelet ~~further comprises~~ comprises a mathematical construct given by:

$$h_r = e_{q_r} \chi_Q \qquad r \in \{0,1,\ldots, p-1\}$$

where $\{e_{A(\mathbf{k})} h_r : \mathbf{k} \in \mathbf{Z}^n, r = 0,1,\ldots,p-1\}$ is $\hat{W}_{-1}$ 'arseval frame

$\{T_{A(\mathbf{k})} F^{-1} h_r : \mathbf{k} \in \mathbf{Z}^n, r = 0,1,\ldots,p-1\}$ is a Parseval frame for W_{-1}, $\psi_r = D\mathfrak{I}^{-1}$

$\{T_{\mathbf{k}}\psi_r : \mathbf{k} \in Z^n, r = 0, 1,\ldots, p\text{-}1\}$ is a Parseval frame for W_0, and $\{\psi_r : r = 0, 1,\ldots, p\text{-}1\}$ is a Parseval frame multiwavelet set associated with the FMRA $\{V_j\}_j$.

17.(**currently amended**) The method of claim 1, further comprising the step of:

decomposing a multidimensional signal, data set, information, or image into ~~a~~ the plurality of non-overlapping ~~subsets~~ sub-bands or resolution levels using a plurality of isotropic, non-separable wavelets derived from the isotropic, non-separable filters and the isotropic, non-separable scaling functions.

18.(**currently amended**) The method of claim 17, further comprising the step of:

forming a reconstructed multidimensional signal, data set, information, or image from the plurality of non-overlapping ~~subsets~~ sub-bands or resolution levels, where the reconstructed

multidimensional signal, data set, information, or image has enhanced boundary properties and has reduced noise.

19.(**previously presented**) The method of claim 1, wherein the number of dimensions is greater than or equal to 2.

20.(**previously presented**) The method of claim 1, wherein the number of dimensions is greater than or equal to 3.

21.(**previously presented**) The method of claim 4, wherein the number of dimensions is greater than or equal to 2.

22.(**previously presented**) The method of claim 4, wherein the number of dimensions is greater than or equal to 3.

23.(**previously presented**) The method of claim 7, wherein the number of dimensions is greater than or equal to 2.

24.(**previously presented**) The method of claim 7, wherein the number of dimensions is greater than or equal to 3.